1

Involutions of Brain.
Monkeys. & Man.

paradoxus, which, like the duck, uses its beak as a tactile instrument in the detection of its food.

— The *infraorbital* branch is often of remarkable size, particularly in those animals that are provided with a snout, or with large vibrissæ upon the upper lip, to the follicles of which it gives considerable branches.

— The *third division*, which supplies, from its ganglionic part, the sensitive and secreting surface of the long tongue, is much developed in *Echidna*. The size of the lingual branch of the trigeminal is still more marked in the *Pangolins* and *Ant-eaters*, esp. in Myrmecophaga jubata.

— The *dentary* branch of the Maxillary is large in *Rodentia* and *Proboscidia*, to meet the demands of the active and persistent matrix of the Incisors.

— The *palatine* nerves attain their maximum size in the *Balænidæ* in relation to the active and extensive growth of baleen.

(*d*) *Hypoglossal* or Ninth.

— *exit* from the skull.

The main roots of each hypoglossal, which quit the Macromyelon usually in two bundles, escape in many *Marsupials* by two precondyloid foramina.

— *size.*

In the *Giraffe* the motor nerve of the tongue is larger in proportion to the body than in the Ox; it is largest in the *Pangolins* and *Ant-eaters* in relation to the great length of the tongue, and frequency and extent of its muscular motions.

CEREBRAL CONVOLUTIONS OF THE ANTHROPIDÆ (MAN) AND SIMIADÆ (APES AND MONKEYS.)*

(Based on M. Gratiolet's *Memoire sur les plis Cérébraux de l'Homme et des Primatés.*)

Four structural peculiarities serve to distinguish the Brains of Man and of the Apes from those of all other animals:—these are

1. The rudimentary condition of the Olfactory lobes.
2. A perfectly defined Fissure of Sylvius.
3. A posterior lobe completely covering the Cerebellum.
4. The presence of a posterior Cornu in the lateral ventricles.

In the Brain of no other animal are these characters found to coexist simultaneously.

The Lemurs are excluded from this group, because in them the Olfactory lobes are large, the Cerebellum is not completely covered, and there is no posterior Cornu in the lateral ventricles.

Although these four characteristics are sufficient warrant for classing an animal amongst the Apes, even if the external surface of its Brain be absolutely devoid of Convolutions, still wherever Convolutions do exist, they are always found to be parts of a definite ground-plan or type, which pervades the whole series.

Owing to its medium development, the Brain of Cercopithecus Sabæus displays most clearly the outlines of this ground-plan, as no obscurity arises either from obliteration of the component primary Convolutions, or from the development of secondary ones. In fact the surface of the Cerebral Hemispheres of the higher Apes and of Man is only a complication of that seen in the Cercopitheci, whilst that of the lower Apes is a simplification of it.

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* This paper was communicated by S. J. Sharkey, Esq., B.A., Jesus College, Oxford.

In the Cercopithecus Sabæus the great Median Fissure divides the Brain into two Hemispheres; each Hemisphere having an external surface, and an internal surface. The *external* surface comprehends all that can be seen on taking a profile view of the Brain: the *internal,* all that is seen on looking at the surface exposed by severing the two Hemispheres from each other by a perpendicular section through the great Median Fissure and Corpus Callosum. The line formed by the junction of these two surfaces above, is the superior border: that formed by their junction below, is the inferior border. The most prominent point of the Frontal lobe, where the two borders meet anteriorly, is the anterior or Frontal extremity: the point where they meet posteriorly, is the posterior or Occipital extremity.

A. *External Surface.*

The lobes on the External Surface are,

1. Frontal.
2. Parietal.
3. Temporo-sphenoidal.
4. Occipital.

The Central lobe, or 'Island of Reil' is hidden within the lips of the Fissure of Sylvius, and corresponds with the inferior aspect of the Corpus Striatum.

The External Perpendicular Fissure divides the External Surface into an anterior and a posterior part: the posterior comprehending the Occipital lobe: the anterior being divided again into two by the Fissure of Sylvius. The portion above this fissure embraces the Parietal and Frontal lobes, that below it the Temporo-sphenoidal lobe.

1. The *Frontal lobe* is limited posteriorly by the ascending branch of the Fissure of Sylvius, or, as Mr. Huxley names it, the Antero-parietal Sulcus. It is divided into an Orbital lobule and a Frontal lobule, the former corresponding to that part which rests on the orbital plate of the Frontal bone. The convolutions of the Orbital lobule are inconstant: those of the Frontal lobule are three in number and all longitudinal in direction, *viz.* :—

a. Superior Frontal.—*b.* Middle Frontal.—*c.* Inferior Frontal, or Supra-ciliary.

2. *Parietal Lobe.* This Lobe is bounded anteriorly by the Antero-parietal Sulcus, posteriorly by the External Perpendicular Fissure.

Three well marked Convolutions belong to this lobe: two of them are vertical in direction, and are separated from each other by the Fissure of Rolando; these are, (*a.*) the anterior of the two, the First Ascending Convolution, (*b.*) the Second Ascending convolution: (*c*) the third is the Curved Convolution, which winds round the superior extremity of the Parallel Fissure: this Convolution has an ascending branch, and a descending branch which is continuous with the Middle Temporal Convolution.

3. *Temporo-sphenoidal Lobe.* This lobe lies below the Fissure of Sylvius. It embraces three Convolutions, which are usually oblique in direction; they are

a. Superior Temporal.—*b.* Middle Temporal.—*c.* Inferior Temporal.

The superior and middle convolutions are separated from each other by the Parallel Fissure, around the summit of which winds the Curved Convolution.

4. *Occipital Lobe.* The convolutions in this lobe are three in number, and take a longitudinal direction. They are

a. Superior Occipital.—*b.* Middle Occipital.—*c.* Inferior Occipital.

The anterior border of the Occipital lobe often, as here, is thin, and projects forward over the external perpendicular fissure: it is then called the 'Operculum.'

There are moreover on the external surface four *Bridging Convolutions*, two of which are of considerable classificatory importance; *viz.* those which connect the Parietal lobe with the Occipital.

The first passes from the posterior extremity of the Second Ascending Convolution to the Superior Occipital Convolution. The second passes from the summit of the descending branch of the Curved Convolution to the Superior Occipital. The third external Bridging Convolution connects the Middle Temporal with the Middle Occipital; the fourth connects it with the Inferior Occipital Convolution. The two latter are always superficial. The others are sometimes superficially, sometimes deeply placed.

B. *Internal Surface.*

About the middle of the Internal Surface is seen the *Great Central Aperture*, round which the Convolutions are ranged and through which the Crus Cerebi passes upwards. It is divided into two parts by the Fissure of the Hippocampus, which bifurcates posteriorly. That portion of the Brain which is placed below this Fissure, together with the Fascia Dentata (Pli Godronné, *Grat.*), which does not come into view on the surface, is called the *Occipito-Temporal Lobe.* The rest of the internal surface is again divided into two by the Internal Perpendicular Fissure, which runs down from the superior border of the Hemisphere and stops short about on a level with the posterior extremity of the Corpus Callosum. That part of the Brain which is below or behind the Internal Perpendicular Fissure, and between it and the posterior part of the Hippocampal Fissure is the *Internal Occipital Lobule*; that above and in front of it is the *Fronto-parietal Lobe.*

1. The *Fronto-parietal Lobe* is divided by the great Fissure of the Frontoparietal Lobe into

a. An Inferior Convolution, Convolution of the Internal Zone, s. Convolution of the Corpus Callosum.—*b.* Convolution of the External Zone.

The Convolution of the Internal Zone expands posteriorly to form the Quadrilateral Lobule.

2. In the *Occipital Lobule* the Convolutions are inconstant.

3. The *Occipito-Temporal lobe* comprehends,

a. The Superior Internal Temporal Convolution (Pli Godronné, *Grat.*), which is placed above, and externally to the so-called anterior part of the Hippocampal Fissure and does not appear on the surface:
b. The Middle Internal Temporal, placed below the Hippocampal, and above the Collateral Sulcus of Huxley. This convolution ends anteriorly in a large Lobule—lobule of the Hippocampal Convolution (lobule de l'Hippocampe, *Grat.*),—and from the extremity of this lobule a little hooked process curves backwards, which is the Hook of the Hippocampal Convolution (Crochet de l'Hippocampe, *Grat.*):
c. The Inferior Internal Temporal which consists of parts of three Convolutions which also take part in the formation of the External surface of the Hemisphere; *viz.* the Inferior External Temporal,—Inferior External Occipital,—and the Middle External Occipital Convolutions.

Two *Bridging Convolutions* also belong to the Internal Surface. They connect the Quadrilateral with the Occipital Lobule, and are sometimes superficially sometimes deeply placed. They are the Superior Internal Bridging Convolution which passes from the summit of the Quadrilateral Lobule, to the summit of the Occipital Lobule, where it is continuous with the Superior External Bridging Convolution: and,—the Inferior Internal Bridging Convolution which unites the base of the Quadrilateral Lobule with the Inferior extremity of the Occipital Lobule.

If the Brain of Man be taken as the standard of Cerebral development, the position of any Ape in a classification, which has the Nervous system for its basis, will depend upon the degree in which its brain resembles that of Man.

The most striking features of the *Human Brain* are—

1. Its great size and complexly convoluted surface.

2. The great development of the Frontal Lobe; and especially of the Superior Frontal Convolution, which is indicated,

(*a.*) By the position of the upper extremity of the Fissure of Rolando, which reaches the superior border of the Hemisphere at a point much further back than in the Apes' Brains:—

(*b.*) By the Antero-Parietal Sulcus meeting the Fissure of Sylvius, not just above the Bend of the Fissure of Sylvius, as in most Apes, but considerably further back:—

(*c.*) By the horizontal position of the Fissure of Sylvius, which is more especially due to the great development of the Superior Frontal Convolution.

3. The small extent of the Occipital Lobe.

4. The comparatively small, and but slightly projecting Temporo-sphenoidal Lobe.

5. The Obliteration of the External Perpendicular Fissure, owing to the great size of the two Superior External Bridging Convolutions, both of which are superficial.

6. The great Antero-posterior extent of the Corpus Callosum.

Amongst the Old World Apes there are three groups, headed respectively by the Orang-Utang (Simia Satyrus), the Chimpanzee (Simia Troglodytes), and the Gorilla, in each of which Cerebral development seems to be progressing on a different plan.

Thus, in the group of which the Orang is chief, in which the brain appears to be developing in the same direction as that of Man, the Frontal and Parietal Lobes gradually increase in size and complexity, the Occipital diminishing *pari passu*:—in the Chimpanzee the Frontal and Occipital lobes are most developed:—whilst in the Gorilla the Parietal and Occipital Lobes predominate.

The Brain of the Orang is more massive than that of the Chimpanzee, and that of the Chimpanzee than that of the Gorilla: but the Occipital Lobe in the Gorilla is larger than in either of the other two (a point of inferiority, since this lobe is so small in Man); and the Frontal lobe is lower: moreover the Convolutions are probably less complicated in the Gorilla's Brain: therefore the Gorilla has the least highly developed Brain of the three.

In the Chimpanzee the Occipital lobe is large,—its Operculum complete—the ascending branch of the Curved convolution generally rises in front of the Fissure of Sylvius, and ascends a considerable distance towards the superior border of the brain. The superior External Bridging Convolution is generally absent; the second is large, but does not usually come to the surface.

In the Orang the Occipital lobe is of moderate size.—the Operculum scarcely perceptible—the Curved convolution rises on a level with the summit of the Fissure of Sylvius—the superior Bridging convolution is large and superficial—the second present, but hidden.

In Man the Occipital lobe is very small, and there is no trace of an Operculum; the origin of the ascending branch of the Curved convolution is on a level with the summit of the Fissure of Sylvius, and both the superior Bridging convolutions are large and superficial. Therefore these three leaders will rank as follows

1. Orang-Utang.
2. Chimpanzee.
3. Gorilla.

The convolutions of the Brain are arranged after the same plan in the Platyrrhine as in the Catarrhine Monkeys: and yet the former have very distinctive Cerebral characteristics, and such as are not found in the latter. Thus, besides the extreme reduction in the size of the Frontal lobe, and the enormous development of the Parietal in some, we find the second External Bridging convolution always superficial in Cebus Capucinus; the convolution limiting the summit of the Fissure of Sylvius hidden in Ateles, without any part of the fissure itself being covered; and the ascending branch of the Curved convolution continuous with the Superior Temporal in the same Monkey—arrangements which do not find a parallel in the Old World Series. The highest group (Sapajous, Grat.) contains Mycetes, Ateles, &c.; they take the first rank, owing to their having a comparatively larger Frontal lobe, and both superior External Bridging convolutions present. Next to these come Cebus Capucinus, and Cebus Apella (Sajous, Grat.). The third group embraces, Callithrix, Nyctipithecus, Pithecia (Sagouins, Aotes, Sakis, Grat.). The fourth, the Hapalidæ, Hapale Œdipus, and Hapale Jacchus (Pinches and Ouistitis, Grat.).

The importance of such characters as the slanting direction of the ascending convolutions of the Parietal lobe, the elevation or depression of the Fissure of the Hippocampi, the height to which the summit of the Curved convolution rises, and others of a similar kind put forward in the table, depends on their being indications of the greater or lesser development of certain parts of the Brain; thus, the convolutions of the Parietal lobe slant when they are pressed backwards by the increasing size of the Frontal lobe:—the Hippocampal Fissure rises high in the connection with the greater development of the Occipital lobe, or is depressed by increase in the lobes placed anteriorly to it:—the Curved convolution is beaten down by the development of the superior Bridging convolutions.

The following is Gratiolet's Classification according to Cerebral Characters:—

1.	Homo.	
2	Simia Satyrus (Orang-Outang, Grat.) Hylobates (Gibbons, Grat.) Semnopitheci (Semnopithèques, Grat.) Cercopitheci (Guenons, Grat.)	Catarrhini (Pithèques, Grat.).
3	Simia Troglodytes (Chimpanzé, Grat.) Macaci (Vrais Macaques, Grat.)	
4	Gorilla (Gorille, Grat.) Cynocephali (Babouins, Grat.) Macacus Rhesus (Macaques à queue courte, Grat.)	
5	Mycetes (Hurleurs, Grat.) Ateles (Atèles, Grat.) Lagothrix (Lagotriches, Grat.)	Platyrrhini (Cèbes, Grat.).
6	Cebus Capucinus (Sai, Grat.) Cebus Apella (Sajou, Grat.)	
7	Callithrix (Sagouins, Grat) Nyctipithecus (Aotes, Grat.) Pithecia (Sakis, Grat.)	
8	Hapale Œdipus (Pinches, Grat.) Hapale Jacchus (Ouistitis, Grat.)	

SYNOPSIS

OF

M. PIERRE GRATIOLET'S

"MEMOIRE SUR LES PLIS CÉRÉBRAUX DE L'HOMME ET DES PRIMATÉS."

N.B.—The Letters and Numbers prefixed to the Lobes, Convolutions, &c., mentioned in the lefthand column, stand for the said Lobes, Convolutions, &c., in each column on the same level to the right.

	CERCOPITHECI.	SEMNOPITHECI.	HYLOBATES, OR GIBBON.	SIMIA SATYRUS, OR ORANG-UTANG.	HOMO.	SIMIA TROGLODYTES, OR CHIMPANZEE.	MACACI. Vrais Macaques. Grat.	MACACUS RHESUS. Macaques à queue courte. Grat.	CYNOCEPHALI.	GORILLA.	ATELES.	LAGOTHRIX.	CEBUS CAPUCINUS.	CEBUS APELLA.	CALLITHRIX.	HAPALIDÆ.
	CATARRHINI.				HOMO.	CATARRHINI.					PLATYRRHINI.					
											SAPAJOUS (GRAT.)		SAJOUS (GRAT.)			
I.—GENERAL FORM. 1 Lobes which are most developed	Long, somewhat thin and prominent at Anterior & Posterior extremity. (1) Parietal and Occipital.	Much like that of the Cercopitheci but more globular. (1) Parietal and Occipital.	More globular still. (1) Frontal and Parietal.	Globular. The brain of a Hylobates only more developed. (1) Frontal and Parietal.	Enormously developed, & very richly convoluted. (1) Frontal and Posterior part of Parietal.	The Brain of a Macacus, but more developed. Longer than in Orang. (1) Frontal and Occipital.	Depressed and flattened but broad. (1) Parietal and Occipital.	Very like that of Cercopitheci. (1) Occipital and Parietal.	Depressed and broad. (1) Occipital and Parietal.*	Flat and depressed. Elliptical in form as in the Cynocephali.	Long. Broader Anteriorly than Posteriorly. (1) Parietal.	Brain of Ateles slightly modified. (1) Parietal.	Ovoid. Round Anteriorly. (1) Parietal.	Like Cercopitheci but more Globular. Angular Anteriorly. (1) Parietal and Occipital.	Fairly Globular. (1) Parts behind and below the Fissure of Sylvius.	(1) Parts behin and below the Fissure of Sylvius.
II.—EXTERNAL SURFACE. A. *Frontal Lobe.* (a) Frontal lobule. 1. Superior Convolution. 2. Middle Convolution. 3. Inferior Convolution. (b) Orbital Lobule.	(A) Long, but depressed and flattened. (a) 1, 2, 3 } Very simple —all about equal. (b) Considerably excavated.	(A) Much more developed than in the Cercopithecei. It is higher and rounder, but yet it is less developed than the Occipital. (1, 2, 3) About equal. (b) Less excavated than in the Cercopithecei.	(A) Larger than the Occipital. (1) Larger than (2) or (3). (b) Less excavated.	(A)* Very high and richly convoluted. (1) Is larger than (2) and (3), and is generally divided into two secondary convolutions. (2 & 3) are generally more or less blended together. (b) Greatly excavated when compared with the same in Man, but less so than in the Hylobates. A sharp beak-like process is developed inferiorly.	(A) High, broad, not attenuated anteriorly as in the Apes. Convolutions extremely variable. (1) Larger than (2) or (3): generally divided into two or three secondary convolutions. (2) Blended with (1) in higher races with (3) in the lower. (b) Very little excavated.	(A) Very large. Not so high as in the Orang, but longer. Larger than in the Macaci. (1) Larger than (2) & (3): divided into two. (2) Generally * distinct but small. (b) Rather less excavated than in the Orang. Very large beak-like projection is developed inferiorly.	(A) Short, but very broad. Convolutions reduced in size, but (1) is large.	(A) Broader and shorter than in the Cercopithecei. Convolutions very poor, especially (1).	(A) Less developed than in the Chimpanzee. (2) and (3) Reduced in size. (1) Large and divided into secondary convolutions.	(A) Larger than in the Cynocephali. Less developed than in the Chimpanzee. It is not so high as in the Chimpanzee: but at the same time it is not so attenuated anteriorly.	(A) Very small, but higher than the Occipital. The Fissure limiting it Posteriorly, is situated Anteriorly to the Bend of the Fissure of Sylvius. This lobe is larger than in Cebus. (1) larger than (2) and (3).	(A) Much like that of Ateles, but rather less developed.	(A) Smaller than in the Sapajous. Round Anteriorly.	(A) Angular Anteriorly.	(A) No Convolutions. Very small but larger than in the Hapalidæ.	(A) Smaller than in Callithrix.
B. *Parietal Lobe.* 1. First Ascending Convolution. 2. Second Ascending Convolution. 3. Curved Convolution.	(B) Moderate in size. (3) Rises in front of summit of the Fissure of Sylvius. Ascending branch is long, makes an acute angle with descending branch and nearly reaches the Superior border of the Brain.	(B) Large. (1) & (2) Simple but slant much more backwards than in the Cercopithecei. (3) Beaten downwards & backwards. The summit forms a round curve. Ascending branch rises on a level with summit of Fissure of Sylvius. The descending branch is a little swollen at its commencement.	(1) and (2) Slant backwards considerably. (2) Is large. (3) Beaten down still more. The origin of ascending branch is on a level with the summit of Fissure of Sylvius. The descending branch still thicker at its commencement.	(B) Well developed. (1) Large at origin, thin at its upper extremity. Slants backwards. (2) Slants backwards more than (1). (1) and (2) Both more flexuous than in Simia Troglodytes. (3) Origin on a level with summit of fissure of Sylvius. Descending branch thick at commencement, and flexuous afterwards.	(B) Well developed (1) and (2) Thick and flexuous. (1) Origin pressed far back from the head of the Fissure of Sylvius by development of Frontal lobe. (2) Origin separated from summit of fissure of Sylvius, by the development of the 'Marginal Lobule.'* (3) Origin rather behind summit of Fissure of Sylvius. Descending branch thin at commencement.	(B) Well developed, but not so large as in the Cynocephali. (1) Thin & smooth, does not slant much backwards. (2) Thin & simple at first. Forms a large lobule Posteriorly, which presents two horizontal convolutions. (3) Rises in front of Fissure of Sylvius. Commencement of descending branch generally thin.	(B) Very long. (1) Very broad, but slightly constricted in its middle part. (2) Thin at first, forms a lobule Posteriorly. (3) Rises in front of Fissure of Sylvius. Does not rise so high or make such an acute angle as in the Macacus Rhesus. Descending branch thin and straight, as in Chimpanzee.	(B) Of Moderate size. (1) and (2) Thin, especially (2). (2) Forms a very small lobule Posteriorly. (3) Rises in front of Fissure of Sylvius. Descending branch thin, makes an acute angle with ascending branch, which is very long.	(B) Long. (1) Very broad at Superior part. (2) Slants greatly backwards, and has a smaller lobule than the True Macaci. (3) Origin in front of the Fissure of Sylvius. Descending branch of moderate size. Ascending branch long.		(B) Very large. (1) Enormous at origin. (2) Pushed far back:—the Fissure limiting it posteriorly, being on a level with the summit of the Fissure of Sylvius. (2) Is thin at first but is divided into two above. (3) Origin behind Fissure of Sylvius. Descending branch thin.	(B) As in Ateles but (1) is a little smaller.	(B) Large. (1) Very large. (2) Thin and undivided Superiorly. (3) Rises Anteriorly to summit of Fissure of Sylvius. Descending branch thick.	(B) Large. (1) Narrow at origin. (3) As in Cebus Capucinus but descending branch is thin.	(B) Very short.	
C. *Occipital Lobe.* 1. Superior Convolution. 2. Middle Convolution. 3. Inferior Convolution.	(C) Large. Longer than high. The Fissure separating (1) from (2) often absent. The Operculum is well developed.	(C) In general form much like that of the Cercopitheci, but smaller. The Operculum is wanting at the spot where the superior Bridging Convolution joins this Lobe.	(C) Reduced still further in size. Deeply Fissured. It is smaller than the Frontal lobe.	(C) Very small, but slightly marked Operculum. Has many Fissures.	(C) Extremely small. No trace of an Operculum. Irregularly convoluted. Anterior border is separated far from descending branch of the Curved Convolution by the development of the Bridging Convolutions. In the Apes they adjoin each other.	(C) Large, higher than long, complete Operculum. Has many Fissures.	(C) Moderate in size. Generally higher than long. Convolutions very simple.* Well developed Operculum.	(C) Large. Very smooth, generally absolutely so. Large Operculum.	(C) Greatly developed, and often richly convoluted. It is longer than high in the Mandrill; higher than long in Papio. Complete Operculum.	(C) More developed than in the Chimpanzee.	(C) Moderate in size. Higher than long. The Convolutions are more numerous in the Posterior than in the Anterior part of the Brain.	(C) As in Ateles, but the Convolutions are a little less numerous in the Posterior region of the Brain.	(C) Short; high; smooth. No Operculum.	(C) Large and complete Operculum.	(C) No Convolutions.	
D. *Temporo-sphenoidal Lobe.* 1. Superior Convolution. 2. Middle Convolution. 3. Inferior Convolution.	(D) Projects greatly. (1) Large.	(D) Does not project so much. (1) Well developed.	(D) Very short. (1) Greatly developed.	(D) Of moderate size. Long but not thick. (1) and (2) Well developed.	(D) Of moderate size. Very long. (1) Thin, fairly flexuous. (2) & (3) Well developed and convoluted.	(D) Has about the same proportions as in the Orang. Long, thin, but not very prominent. (2) Well developed.	(D) Does not project much. Convolutions much like those of the Cercopitheci.	(D) Large and prominent. (2) Very large.	(D) Long. Does not project much. (2) Well developed.	(D) Does not project so much as in the Chimpanzee, probably because the Inferior Frontal Convolution is not so well developed.	(D) Long, thin. Does not project much. (2) Well developed.		(D) Not as prominent as in Cebus Apella.	(D) Large and prominent.	(D) Very large and prominent. There is a deep Fissure Inferiorly on this lobe, separating the External from the Internal surface of the Brain.	
E. *Central Lobe.*					(E) Very large											
III. INTERNAL SURFACE. A. *Fronto-parietal Lobe.* 1. Convolution of the External Zone 2. Convolution of the Internal Zone 3. Quadrilateral Lobule.	(3) Well defined but smooth.			(1) Smooth and simple. (2) Greatly developed. (3) Well developed, but not so much as in Man.	III. Very simple in its convolutions. (1) Well convoluted; divided into two Anteriorly. (2) Greatly developed Posteriorly, simple Anteriorly. (3) Greatly developed. It reaches its maximum in Man. Fissured, but not deeply.		(3) Large.		III. The distance from Posterior Extremity of the Brain to the Posterior Extremity of the Corpus Callosum is greater than in the True Macaci. (3) Large and Fissured.						III. Above the Corpus Callosum, absolutely smooth	
B. *Internal Occipital Lobule.*	(B) Small, narrow, high.				(B) Triangular in form; well developed. Fissured, but not deeply.		(B) Upright; narrow; high.		(B) Inclines a little forwards.		(B) Triangular. Covered with Fissures.		(B) Narrow.			
C. *Occipito-temporal Lobe.* 1. Superior Convolution. 2. Middle Convolution. 3. Inferior Convolution.		(2) The Hook of the Hippocampal convolution is small.	(2) The Hook of the Hippocampal convolution is large	(2) and (3) Both simple.	(C) Reduced in size, and less excavated for the Cerebellum. (2) Simple, short, and smooth. (3) Greatly developed.		(C) The Convolutions do not rise so high posteriorly as in the Cercopithecei, being beaten down by the development of the Parietal Lobe.		(2) Broad. Has Secondary Convolutions.				(C) Convolutions very thin.			
IV.—BRIDGING CONVOLUTIONS 1. First External. 2. Second External. 3. Third External. 4. Fourth External. 5. First Internal. 6. Second Internal.	(1) and (2) Both hidden under the Operculum. (2) Generally very small except in Simia Rubra (Patas Grat.). (5) and (6) Well marked.	(1) Large and entirely superficial. (2) Small & hidden.	(1) Enormous & entirely superficial. (2) Small and hidden.	(1) Very large, flexuous & superficial. (2) Small and hidden.	(1) & (2) Thick, flexuous, superficial, enormously developed. (1) Has many convolutions. (3) & (4) Comparatively small. (5) & (6) Small and hidden.	(1) Absent. (2) Hidden, but large. [This is what Gratiolet says, but it by no means always holds good, as (2) is sometimes, and (1) very often developed and superficial].	(1) Absent. (2) Large, but hidden. (5) and (6) Large and distinct.	(1) Absent. (2) Large, but hidden.	(1) Absent. (2) Greatly developed but hidden.		(1) Large. (2) Small. Both are superficial. (5) and (6) Hidden & very small.	(1) Superficial. (2) Small and hidden.	(1) Absent. (2) Large and Superficial. (5) and (6) Of considerable size.	(1) Absent. (2) Large but hidden. (5) and (6) Of considerable size.		
V.—FISSURES. 1. Fissure of Sylvius. 2. Fissure of Rolando. 3. External Perpendicular. 4. Internal Perpendicular. 5. Parallel. 6. Hippo-campal.	(1) Makes a large angle, with a line drawn horizontally to meet it at its summit. The summit rises very high and is always covered by the descending branch of Curved Convolution. (4) Vertical. (6) Rises very high Posteriorly. The lower branch of its bifurcation is the longest (so Gratiolet says, but it by no means always holds good).	(1) Much more horizontal. Summit beaten downwards, and not covered by Curved Convolution. It makes a smaller angle with the horizontal line. (4) and (6) Both beaten down considerably.	(1) Summit uncovered. Marginal convolutions well developed. (4) and (6) Both beaten downwards and backwards, and almost join each other.	(1) Summit uncovered, does not make a large angle with Horizontal line. Marginal Convolutions well developed.	(1) Nearly horizontal. (3) Obliterated. (4) Pushed downwards and backwards. (6) Almost horizontal and meets (1).		(1) More horizontal than in Macacus Rhesus. The Summit is often covered by descending branch of the curved convolution. (4) Thrown far back. (6) Nearly horizontal. The upper branch of the Bifurcation is longest.	(1) Summit not usually covered. (5) Ascends very high on the Brain. (6) Nearly horizontal, upper branch longest.	(6) Nearly horizontal. The two branches of the Bifurcation nearly equal.		(1) The convolution which limits the summit of this Fissure, though apparently absent is really hidden under the 'lips' of the Fissure of Sylvius. (3) Obliterated. (5) Though the curved convolution which surrounds this Fissure rises behind the Fissure of S. it nevertheless ascends very high on the Brain & the ascending branch appears to be continuous with the Superior Temporal Convolution. (4) & (6) form a right angle together. (6) Almost horizontal.	(1) As in Ateles. The limiting Convolution is however slightly better defined. (5) As in Ateles	(1) The limiting Convolution is present. (6) Upper branch rises high.	(1) As in Cebus Capucinus.	(1) Rises higher on the Brain and makes a larger angle with a horizontal line than in any other Apes.* (5) Present. (6) Deep.	(1) Present. (5) Present as a trace in Hapale Œdipus, not in Hapale Jacchus, (So says Gratiolet: but it is sometimes present in Hapale Jacchus).
				* These convolutions vary much in the different individuals.	* This Lobule is peculiar to Man, but it is not always well developed.	* In all these high apes the convolutions vary greatly.	* In both the True Macaques and those with a short Tail, the Parietal and Occipital lobes are most developed. But the Parietal is more developed than the Occipital in the True Macaques; and the Occipital than the Parietal in the others.		* In the Mandrill the Occipital is much larger than in the Papio.						* The only Fissures on external face are Sylvian & in the Moloch the Fissure limiting the summit of the Curved Convolution.	